

Risky Business: Challenges and Successes in Military Radiation Risk Communication

COL Mark A. Melanson, MS, USA

Lori S. Geckle

Bethney A. Davidson

ABSTRACT

Given the general public's overall lack of knowledge about radiation and their heightened fear of its harmful effects, effective communication of radiation risks is often difficult. This is especially true when it comes to communicating the radiation risks stemming from military operations. Part of this difficulty stems from a lingering distrust of the military that harkens back to the controversy surrounding Veteran exposures to Agent Orange during the Vietnam War along with the often classified nature of many military operations. Additionally, there are unique military exposure scenarios, such as the use of nuclear weapons and combat use of depleted uranium as antiarmor munitions that are not found in the civilian sector. Also, the large, diverse nature of the military makes consistent risk communication across the vast and widespread organization very difficult. This manuscript highlights and discusses both the common and the distinctive challenges of effectively communicating military radiation risks, to include communicating through the media. The paper also introduces the Army's Health Risk Communication Program and its role in assisting in effective risk communication efforts. The authors draw on their extensive collective experience to share 3 risk communication success stories that were accomplished through the innovative use of a matrixed, team approach that combines both health physics and risk communication expertise.

RISK COMMUNICATION:

WHAT IT IS AND WHAT IT IS NOT

Chances are, if you asked a group of health physicists to define risk communication, you would get a wide variety of answers. Fortunately, there is a commonly accepted definition of risk communication:

Risk communication is an interactive process of the exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management.¹

Although communication with the public is typically thought to be a public affairs or public relations function, the authors view risk communications as a unique discipline with expertise in communication that combines an understanding of science and its limitations with an appreciation of the psychology and sociology of how people, individually and collectively, process, understand, and ultimately come to accept or reject risks to human health.

Having provided a commonly accepted definition of risk communication, we now attempt to debunk some popular myths about it. First, risk communication is not a "quick fix" for dealing with a crisis, nor is it an afterthought in responding to an emergency, or a panacea for handling public concerns. Risk communication is never a one-way dialogue simply "telling" the public what the

risks are, thereby ending the matter. Nor is risk communication public affairs or public information, where the purpose is to convey an organization's message, story, or agenda.¹ And finally, risk communication is never, ever "spin." In its truest sense, risk communication is a combination of "tools" to be used when concern is high, and "processes" that integrate risk communication factors into the overall risk management of an issue. This paper outlines the use of these concepts in actual real-world situations involving radiation risk.

COMMON AND UNIQUE CHALLENGES OF MILITARY RADIATION RISK COMMUNICATION

Communicators of military radiation risk share all of the common challenges of anyone conveying radiation risks. First, the very nature of radiation makes communicating its risks very difficult. Although radiation is ubiquitous, exposure is imperceptible to the human senses, making it both unfamiliar and seemingly nefarious. Also, radiation risk is highly complex: radiation exposure at very high doses can cause immediate death clearly due to its effects, while at low doses it may or may not cause cancer years or decades after exposure (and if induced, these cancers cannot be identified as radiogenic). Further complicating matters is the fact that radiation can be both an internal and external hazard, depending upon the radionuclide and the type of radiation it emits (alpha, beta, gamma, etc). The general public's overall understanding about radiation is also extremely limited and often tainted and distorted by misrepresentation of

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Risky Business: Challenges and Successes in Military Radiation Risk Communication			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Armed Forces Radiobiology Research Institute,Bethesda,MD,20889			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADA563387,AMEED, July - September 2012					
14. ABSTRACT Given the general public's overall lack of knowledge about radiation and their heightened fear of its harmful effects effective communication of radiation risks is often difficult. This is especially true when it comes to communicating the radiation risks stemming from military operations. Part of this difficulty stems from a lingering distrust of the military that harkens back to the controversy surrounding Veteran exposures to Agent Orange during the Vietnam War along with the often classified nature of many military operations. Additionally, there are unique military exposure scenarios, such as the use of nuclear weapons and combat use of depleted uranium as antiarmor munitions that are not found in the civilian sector. Also, the large, diverse nature of the military makes consistent risk communication across the vast and widespread organization very difficult. This manuscript highlights and discusses both the common and the distinctive challenges of effectively communicating military radiation risks, to include communicating through the media. The paper also introduces the Army's Health Risk Communication Program and its role in assisting in effective risk communication efforts. The authors draw on their extensive collective experience to share 3 risk communication success stories that were accomplished through the innovative use of a matrixed, team approach that combines both health physics and risk communication expertise.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 7	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

its risks in popular culture, the news media, and by activists. Finally, society's risk appetite has changed over time, with increased demands by society's members to be involved in risk management decisions that personally affect them, and a decreased overall societal tolerance of risk in general (eg, demands for zero risk).

Added to this already contentious situation are the unique challenges of communicating military radiation risks. First, there is a latent distrust of the military that harkens back to the legacy of veteran exposures to Agent Orange during the Vietnam War. Also, many military operations are classified, thereby serving as a serious barrier to open risk communication. To further complicate things, the military also has its own unique and sometimes unfamiliar radiation sources, such as nuclear weapons and depleted uranium which, because of its unique metallurgic properties, makes it both an ideal antiarmor munition and armor plating. Finally, the military is a large, diverse, bureaucratic organization with many stovepipe* and silo† components, making consistent risk communication a constant challenge.

COMPONENTS OF RISK COMMUNICATION

In the field of general communication, there are 3 distinct components, normally listed in this order: messenger, message, and audience. However, in health physics, one typically starts with the message (what is the dose), then focuses on the audience (patients, workers, general public), and rarely, if at all, do health physicists think about themselves, the messengers. Conversely, in this paper, we deliberately choose to begin with the audience because, in our opinion, understanding the audience is the most important part of effective risk communication. However, as mentioned previously, it is usually considered secondarily, at best. Important information about the audience includes their actual concerns (not what the experts think are their concerns); other risks they may be facing; their level of understanding of science and their trust in both it and in scientists; their preconceptions about radiation and its risks; and other cofactors such as possible economic loss due to radiological contamination, potential stigma by being "contaminated or exposed," and their overall perception of social justice. Research also shows that the human brain processes risk information differently when concern is high, so it is important to account and plan for these changes in message development and overall risk communication efforts, particularly about radiation risks.⁴

*An organizational structure in which the flow of information is restricted to up and down through lines of control but is inhibited or prevented from moving across the organization.²

†A silo structure is one that functions almost entirely within itself, without interaction, communication, or cooperation with other components of the organization.³

Next, we address the messenger, the one actually communicating the risk. Often, health physicists find themselves as risk communicators because of their unique expertise in radiation safety. However, while this expertise is essential, the most important trait in an effective risk communicator is empathy.⁵ This is because worried people need their emotions and perceptions about specific risks verbally and visibly acknowledged by the risk communicator before productive communication can take place. Additionally, a messenger must be open, honest, and sincere. Since many risk communication events can be quite emotionally heated, the health physicist must also be able to practice the fine art of deflection and detachment, not taking any anger or hostility personally (which sounds easy but is very difficult to do in practice!). Other factors to consider are the ability to deal with uncertainty by describing what is known, what is not known, and what will be done to fill any data gaps; a genuine commitment to follow up; and being both willing and prepared to go the extra distance to address the audience's concerns (such as offering dosimetric monitoring or bioassay sampling even when it is not legally required or deemed scientifically necessary).

Finally, we address the message. Although it's tempting to merely develop messages based on a radiological assessment alone, the most effective messages are those that balance what the audience wants to know with what you need to provide (thus our focus on the audience first). No more than 3 messages should be provided in a given situation, since the human brain when under stress is capable of processing only limited amounts of information.⁶ Messages should be simple (provided in the language of the audience) and concise, but not condescending. Also, messages should always avoid the use of jargon and never include humor. The messages should be brief (7-12 words, if possible) and include the reemphasis of its clear points. Whenever possible, messages should be validated by credible independent third party sources, such as the National Council on Radiation Protection and Measurements or the International Commission on Radiological Protection for international audiences.

THE ARMY'S HEALTH RISK COMMUNICATION PROGRAM

Health risk communication expertise within Army Medicine is available from 2 sources. First, risk communication expertise is now available within the Communication Directorate at the Army Medical Command (MEDCOM) headquarters. This is a new skill set within the Directorate intended to support issues MEDCOM-wide and is slowly being integrated into sensitive, high-profile projects throughout the Command. The subject matter expert (SME) provides senior-level risk communication

guidance to identify and develop strategies to minimize communication and reputational risks, strengthen audience confidence in Army medicine, increase risk and crisis communication skills level and standardize crisis communication response throughout MEDCOM, and improve the effectiveness of communication efforts. The SME has provided risk communication recommendations and guidance to numerous MEDCOM-wide issues, including the temporary removal of dietary supplements, Soldier death from rabies, allegations of inadequate behavioral health care, use of expired blood products, and allegations of the use of recalled test questions in the Army's radiology residency program. The risk communication SME has also provided onsite assistance to medical risk communication issues, such as the recent medical reevaluations of Soldiers seen by the forensic psychiatry team at the Madigan Army Medical Center.

The second source is the Army Public Health Command's Health Risk Communication Program (HRCPP), established in 1989 in response to increasing demands from the Army and the public for a broader approach to public health risks. The HRCPP initially focused on risk communication training, but the program has expanded and now provides technical consultative expertise to customers throughout the Department of Defense, responding to the broad spectrum of health risk communication issues, including radiation. The HRCPP staff members are highly trained and seasoned health risk communicators with diverse academic backgrounds, including education, public health, and health communication.

The HRCPP supports the 3 components of the risk communication process (audience, messenger, and message), actively gathering qualitative data (eg, surveys, focus groups, sensing sessions) from concerned populations to assist in more effective communication throughout an entire project. The HRCPP also uses audience feedback tools (eg, focus groups) to pretest and validate risk communication message effectiveness, for example, examining if the information presented is understandable, and are there words and/or phrases that resonate poorly with the target audience. The HRCPP can assist risk communication messengers, often scientific subject matter experts who rely primarily on quantitative data, in becoming more effective. To this end, it provides several risk communication training options: introductory, advanced, and specialized. Over the past decade, the HRCPP has provided several tailored and focused training sessions to Army health physicists, the most recent being a 2-day workshop based upon an actual case study involving the potential overexposure of a Soldier to 200 cSv. (It was determined that the Soldier's dosimeter had

been intentionally irradiated after the individual had worn it and turned it in.) The workshop included role-playing risk communication exercises involving actors playing the roles of the potentially exposed Soldier, his wife, and a news reporter.⁷ Finally, the HRCPP provides complete support to public health crisis events, including the development and implementation of a comprehensive communication strategy, identifying and engaging key audiences, and providing on-the-ground support throughout the risk communication intervention to the evaluation phase.

The following case studies fully illustrate the comprehensive support provided by the Army's health risk communication assets.

THREE MILITARY RADIATION RISK COMMUNICATION SUCCESS STORIES

The first radiation risk communication success story we present occurred in 2003, during the early phases of Operation Iraqi Freedom. High level concerns were raised about the safety of US troops occupying the Tuwaitha Nuclear Research Center, the crown jewel in Saddam Hussein's nuclear weapons program, located just outside of Baghdad. At the time, over 4,000 Soldiers and Marines were in and around the facility which had been recently bombed during coalition operations, and vandalized and looted by local Iraqis. The decision was quickly made to assemble a special scientific team from within USACHPPM and expedite its dispatch to Iraq in order to perform a thorough field assessment and communicate the risks to the US forces deployed there.⁸

Since it was obvious that this was a radiation risk communication intervention, a matrixed team combining health physics (HP) and RC expertise was formed to develop a response strategy. First, the deploying team leader was provided refresher RC training and, based on demographic information and communication preferences of the units on the ground, key RC messages for the response were developed: (a) the team was deployed because of Army leadership concerns about protecting their troops; (b) the team's mission was to ensure the safety of US forces; and (c) the team was comprised of the Army's foremost radiation experts. Upon arrival, the team leader immediately met with the deployed Soldiers to present the situation and explain the safety of ambient radiation levels. Once environmental samples were analyzed and the risk assessment was completed, it was determined that the Soldiers were safe (the highest upper bound dose equivalent was estimated to be 1.2 cSv, which is less than one fourth on the annual allowable dose for radiation).⁹ Fact sheets were then developed and provided to the units and their direct leadership.



COL Melanson, the leader of the assessment and radiation risk communication team, describes the situation and explains the safety of ambient radiation levels to deployed Soldiers at the Tuwaitha Nuclear Research Center outside of Baghdad, Iraq in 2003. Photo provided by COL Melanson.

Complementary RC was also provided to key stakeholders at all higher echelons of command. As a direct result of this successful intervention, Soldier concerns were satisfactorily addressed and the situation never escalated to become a public affairs issue or result in congressional interest.

The second intervention occurred in early 2004, when members of the 442nd Military Police (MP) Company, New York Army National Guard, redeployed from Iraq and were inappropriately denied routine postdeployment bioassay screening for depleted uranium. Disgruntled about their lack of medical testing, some of the Soldiers approached a local paper, the *New York Daily News*, for assistance. Despite the ethical implications of becoming part of the story, the paper coordinated and funded the collection and analysis of urine bioassay samples from the Soldiers.¹⁰ The *New York Daily News* sent the samples for analysis to the Uranium Medical Research Centre (UMRC)(Toronto, Canada), a self-proclaimed independent, nonprofit organization and alleged activist group opposed to use of depleted uranium. When the UMRC sent the medical specimens to a nonaccredited geology laboratory, depleted uranium was detected (though no amounts reported) and the story immediately became headline news internationally and evoked widespread concern, including congressional inquiries.^{11,12}

As in the previous case study, a matrixed team was quickly assembled with HP and RC expertise (a physician was also added to the team). The team immediately went to Fort Dix, New Jersey on a fact-finding mission to meet with and listen to Soldiers and their Families, a key first step in effectively identifying true concerns and communication needs. An environmental sampling team was also sent to the 442nd MP Company's base

camp in Iraq to survey for depleted uranium (none was detected). Risk communication training was provided to the medical staff at the Fort Dix hospital and the 442nd Soldiers were finally offered bioassay testing. Even though not medically required, offering the option to be tested reinforced the critical risk communication message that the Army truly cared about Soldier welfare. Despite the offer, only about one fourth of the roughly 200 Soldiers in the unit wanted to be tested (all of the results were consistent with natural uranium and within normal levels, as reported by the Centers for Disease Control and Prevention (CDC)).¹³ Once available, bioassay results were discussed with the individual Soldier, military Families, and healthcare providers. Briefings were also provided to senior National Guard leadership and select members of Congress from New York. Once again, due to the prompt and effective response, all stakeholder concerns were addressed and the crisis was successfully resolved.

The final case study event occurred in the summer of 2007, when a medic from the Army's 101st Airborne Division redeployed from Iraq. Having been to the Tuwaitha Nuclear Research Center (TNRC) during his deployment, the medic contacted the CDC to ask about the health risks of radiation exposure because of health problems he was experiencing. Fortunately, an Army physician, who was coincidentally doing a fellowship at CDC, was contacted and the matter was properly referred to the Army Medical Department. As with the 442nd MP Company, the media also became involved, though much later in the response than the previous case.

As before, a matrixed team of HP, RC and medical experts was assembled. A comprehensive RC strategy was developed to respond to all stakeholders. Support from senior Army leaders ensured full cooperation by all Army participants. Despite some initial reluctance to engage other recently redeployed Soldiers at Fort Campbell (home of the 101st Airborne), the natural inclination to "just let sleeping dogs lie" was overcome.¹⁴ Updated information about Tuwaitha was obtained from "boots on the ground" Army HP assets to augment what was already known about the site and provided to unit Soldiers. After interviewing the medic, RC messages were developed: (a) the TNRC was safe; (b) all the radioactive sources at TNRC had been properly contained and safely stored; (c) anyone desiring testing could provide a bioassay sample. Given that, preparations were made for the "nightmare scenario" of hundreds of individuals simultaneously wanting bioassays. As it turned out, however, only the medic ultimately wanted to be tested (his results were either below detection limits for anthropogenic radioactive sources located on the site or within

CDC reported dietary levels for other naturally occurring radionuclide).¹⁵ In order to assist other potentially concerned Soldiers, a combined HP and RC team deployed to Fort Campbell (where an onsite medical expert joined the team) and 3 town hall meetings were held for Soldiers, their Families, and members of the local press. By delivering the actual briefing prepared for the Soldiers to the assembled reporters, the team leader was able to tell the good news story that the Army was genuinely concerned and was making sure that its Soldiers were safe. During all of the town hall meetings, the team's RC expert observed the HP's message delivery and response to questions, and provided real-time feedback to enhance the process. Once again, the concerns of stakeholders were addressed and the crisis was satisfactorily resolved. Feedback from the initially concerned medic and his fellow Soldiers indicated the response was effective, and press reports were very favorable overall.¹⁶

SUMMARY AND CONCLUSIONS

Risk communication is more than just a message; it is both a discipline and a process. Military radiation risk communication shares all of the difficulties of communicating civilian radiation risks along with its own unique challenges. Effective risk communicators address all three of the components of communication: audience, messenger, and message, specifically in that order. The Health Risk Communication Program is a vital corporate asset of the United States Army that provides unique and essential expertise to enhance risk communication, whatever the risk. The proper partnering of health physics and health risk communication expertise, coupled with senior leadership support, allayed public concerns and diffused 3 high stakes crises, despite media involvement and Congressional scrutiny in two of them. As illustrated in the case studies discussed, effective risk communication is actually achievable and we firmly believe that without it, properly responding to crises, actual or perceived, is impossible.

RECOMMENDATIONS

Recognizing that risk communication is a discipline and a process, not merely a product, is essential for success. All health physicists should add risk communication training as part of their professional development, and integrate risk communication into their ongoing professional practice, and not just during emergencies. Whenever possible, health physicists should seek to partner with competent health risk communicators in a matrixed team, thereby exploiting the synergy between these 2 diverse, yet complimentary disciplines. Finally, health physicists should also share their risk communication success stories, along with their failures, so others can learn from their experiences.

REFERENCES

1. National Research Council. *Improving Risk Communication*. Washington, DC: National Academies Press; 1989.
2. Handy C. *Understanding Organizations*. New York, NY: Oxford University Press; 1993.
3. Rosen E. Smashing silos. *Bloomberg Businessweek* [serial online]. February 5, 2010. Available at: http://www.businessweek.com/managing/content/feb2010/ca2010025_358633.htm. Accessed February 24, 2012.
4. Centers for Disease Control and Prevention. Crisis and Emergency Risk Communication Course. Available at: <http://www.bt.cdc.gov/CERC/overview.asp>. Accessed February 21, 2012.
5. Covello PR, Peters RG, McCallum DB. The determinants of trust and credibility in environmental risk communication. *Risk Anal*. 1997;17(1):43-54.
6. Environmental Protection Agency. *Communicating Radiation Risks: Crisis Communication for Emergency Responders*. Washington, DC: Office of Radiation and Indoor Air, US Environmental Protection Agency; 2007. EOA-402-F-07-008. Available at: <http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=500025HA.txt>. Accessed February 21, 2012.
7. Melanson MA, Geckle LS, Kukral LC, Costanza M. Mystery of the X-ray overexposure: an innovative risk and media communication mentoring workshop. *US Army Med Dept J*. April-June 2010:36-42.
8. Melanson MA, Matcek GJ, Goodison SG, Alberth DP. Assessing and communicating radiation risks in Iraq. *US Army Med Dept J*. January-March 2004:39-43.
9. Melanson MA, Goodison S, Szrom GA, Falo GA, Alberth DP. Deployment radiation risks to US troops at the Tuwaitha Nuclear Research Center during the early phases of Operation Iraqi Freedom. *Proceedings of the 38th Health Physics Society Midyear Meeting*. McLean, VA: Health Physics Society; 2005:171-176.
10. Editorial Staff. Protect the health of U.S. troops. *New York Daily News*. April 7, 2004. Available at: <http://archive.truthout.org/article/new-york-daily-news-protect-health-us-troops>. Accessed November 8, 2009.
11. Gonzalez J. The war's littlest victim Daily News exclusive: he was exposed to depleted uranium. His daughter may be paying the price. *New York Daily News*. September 29, 2004. Available at: http://articles.nydailynews.com/2004-09-29/news/18277829_1_urine-birth-defects-natural-uranium. Accessed February 21, 2012.

12. Moritz O. Hil stands with News in call for G.I. testing. *New York Daily News*. September 30, 2004. Available at: http://articles.nydailynews.com/2004-09-30/news/18278387_1_depleted-uranium-soldier. Accessed February 21, 2012.
13. Centers for Disease Control and Prevention. National Health and Nutrition Examination Survey, 2003-2004. Available at: http://www.cdc.gov/nchs/nhanes/nhanes2003-2004/nhanes03_04.htm. Accessed February 21, 2012.
14. Melanson MA, Goodison S, Szrom F, Falo GA, Alberth DP. The 101st Airborne Division and the Tuwaitha Nuclear Research Center: a case study in effective post deployment radiation risk communication. Paper presented at: Annual Meeting of the Health Physics Society; July 15, 2009; Minneapolis, Minnesota.
15. Centers for Disease Control and Prevention. National Health and Nutrition Examination Survey, 2005-2006. Available at: http://www.cdc.gov/nchs/nhanes/nhanes2005-2006/nhanes05_06.htm. Accessed February 21, 2012.
16. Hall KM. Army: troops at Iraqi nuclear site not exposed to high radiation. *Log Cabin Democrat* [serial online]. November 28, 2007. Available at: http://thecabin.net/stories/112807/loc_1128070011.shtml. Accessed November 28, 2007.

AUTHORS

COL Melanson is the Director of the Armed Forces Radiobiology Research Institute, Bethesda, Maryland.


Ms Geckle is Strategic Risk Communication Specialist, US Army Medical Command, Fort Sam Houston, Texas.

Ms Davidson is a Risk Communicator with the Health Risk Communication Program, US Army Public Health Command, Aberdeen Proving Ground, Maryland.

Latest volume of the Textbooks of Military Medicine series


Combat and Operational Behavioral Health

Editor: Elspeth Cameron Ritchie, MD, MPH, Colonel (Retired), Medical Corps, US Army



Under Fire, by Darrold Peters. Digital Oils/ArtRage 2.0, 2006.
Art: Courtesy of the US Army Center of Military History.

Setting the Stage
In Theater
The Road Home
Reunion and Reintegration
Surveillance and Intervention
Military Children and Families
Operational Behavioral Health
Other Military Issues

 **BORDEN**
INSTITUTE

United States Army Medical Department
Office of The Surgeon General
AMEDD Center & School

To Order: bordeninstitute.army.mil

